MiniSim 1000

Multi Parameter Patient Simulator

INSTRUCTION MANUAL

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Warranty

Netech warranties the MiniSim 1000 Multi-Parameter Patient Simulator against defects in materials and workmanship for one year from the date of original purchase.

During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you return the product shipping prepaid to Netech Corporation. This warranty does not apply if the product has been damaged by accident or misuse, or as the result of service or modification by other than Netech Corporation, or if its serial number is defaced or removed.

Netech reserves the right to discontinue the MiniSim 1000 at any time, and change its specifications, price, or design without notice and without incurring any obligation. Netech guarantees availability of service parts for 5 years after the manufacture of the unit is discontinued.

The warranty is void if you elect to have the unit serviced and / or calibrated by someone other than Netech.

The purchaser assumes all liability for any damages or bodily injury that may result from the use or misuse of the unit by the purchaser, his employees, agents or customers.

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1.1 Introduction

GENERAL DESCRIPTION

The MiniSim 1000 Multi-Parameter Patient Simulator is an advanced microcontroller based instrument. It is designed to simulate patient signals of ECG, arrhythmia, invasive blood pressure, respiration, and temperature. The device also simulates square, sine, triangle, and pulse performance waveforms.

The easy to operate MiniSim 1000 is menu driven via eight tactile feel soft keys. All functions are displayed on a two line sixteen character LCD display.

The small hand held instrument is powered by one 9 Volt battery or an optional AC adapter. The MiniSim 1000 is CE marked and shipped with a Certificate of Calibration traceable to the NIST.

The MiniSim 1000 is a rugged instrument that performs its simulations quickly, accurately, and with ease.

1.2 Specifications

ECG: 12 leads with independent outputs referenced to RL.

NORMAL SINUS RHYTHM (NSR)
ECG Rates: 30, 60, 70, 80, 90, 100, 120, 150, 180, 210, 240, 270, 300, and 350 BPM. Accuracy 0.5%.

Amplitudes: 0.15, 0.3, 0.5, 1.0, 2.0, 3.0, 4.0, and 5.0 mV on Lead II. Lead 1 is 0.6 X Lead II, Lead III is 0.4 X Lead II, and Lead V is the same as Lead II.

High Level: 500 X low level output on Lead II.
Accuracy: 2% (1-5mV).

PERFORMANCE WAVEFORMS (PERF)
Sine, Square, Triangle, Pulse

Frequencies: 0.1 to 0.9 in 0.1 Hz steps.
1.0 to 9.0 in 1.0 Hz steps.
10 to 100 in 10 Hz steps.

Accuracy: 1%

Amplitudes: 0.1, 0.2, 0.5, 1.0, 2.0, 3.0, 4.0, and 5.0 mV on Lead II.
Pulse: 20 ms pulse of 1mV amplitude repeated at 4 second intervals.

R WAVE DETECTION (RWD)

Widths: 10, 40, 50, 60, 70, 80, 90, 100, 110, and 120 ms.
Amplitudes: 0.15, 0.3, 0.5, 1.0, 2.0, 3.0, 4.0, 5.0 mV on Lead II.

PACER (PCR)

AP: Atrial Pacer set at 70 BPM.
ASP: Asynchronous Pacer – Ineffective Pacing.
Pacer Amplitudes: + 2 mV and –2mV.
QRS Amplitudes: 1 mV
PCR: Pacer pulses alone.
Pacer Widths: 0.1, 0.2, 0.5, 1.0, 1.5, and 2.0 ms.
Amplitudes: 0.15, 0.3, 0.5, 1.0, 2.0, 3.0, 4.0, and 5.0 mV.
VP: Ventricular Pacer set at 70 BPM.
AVP: Atrial Ventricular Pacer set at 70 BPM.
QRS Amplitude: 1 mV.
Pacer Amplitude: -2mV.

RESPIRATION

Baseline Impedance: 250, 500, 750, and 1000 Ohms.
Delta Impedance: 0.1, 0.5, 1.0, and 1.5 Ohms.
Accuracy: 10%.
Rates: 15, 30, 60, and 120 BPM.
Accuracy: 1%
Apnea: Off, continuous, 12 seconds and 32 seconds.
Lead Configuration: Leads I and II.

BLOOD PRESSURE

Impedance: 350 Ohms.
Excitation: 2 to 16 Volts.
Sensitivity: 5μV/V/mmHg.
Static: 0, 5, 10, 20, 25, 30, 40, 50, 100, 150, 200, and 300 mmHg.
Dynamic: 50/10, 60/20, 70/30, 80/40, 100/60, and 120/80 mmHg. Dynamic waveforms track all NSR rates.

TEMPERATURE

Compatibility: YSI 400 and 700 Series.
Temperature: 25 and 37 degrees Centigrade.
Accuracy: 2% of setting

POWER REQUIRMENTS:

One 9 Volt alkaline battery or optional AC adapter.

PHYSICAL CHARACTERISTICS:

Dimensions: 5.5 X 3.5 X 1.5 inches (13.9 X 8.9 X 3.8 cm).
Weight: 10 oz (0.3 kg).

TEMPERATURE REQUIREMENTS:

Operating: 59 to 95° F (15 to 35°C).
Storage: 32 to 131° F (0 to 55°C).

CALIBRATED DC OUTPUTS:

10 Calibrated DC outputs from 0.04 to 2 mV.

OUTPUT CONNECTIONS:

Part # 303, Open Ended Pressure cable:

Pressure:	Single Pressure
Pin 1	+ Excitation
Pin 4	+ Signal
Pin 2	- Signal
Pin 5	- Excitation

Pressure:	Dual Pressure
Pin 3	+ Signal
Pin 2	- Signal

Part # 304, Open Ended Temperature Cable:
3.5 mm Stereo Jack

YSI 400	Tip, Ring, Shield.
YSI 700	Tip, Ring.

High Level Output: 3.5 mm Stereo Jack

Signal Positive	Tip
Signal Ground	Shield
Input/Unused	Ring

Note: Specifications are subject to change without notice.

1.3 ACCESSORIES

Description	Part Number
User Manual	300-Manual
Pressure Cable (Open Ended)	303
Temperature Cable (Open Ended)	304

OPTIONAL ACCESSORIES

Description	Part Number
Soft Carrying Case	301
110 VAC Adapter	302
220 VAC Adapter	302-220
ECG Snap Studs	1000
Space Labs Dual	305
Space Labs Single	305-S
Datascope Dual	306
Datascope Single	310
Hewlett Packard Dual	307
Hewlett Packard Single	308
Fukuda Denshi Dual	309
Bard Dual	311
Bard Single	311-S
Mennen Medical Single	312
Ivy Biomedical Single	314

Other Interface cables available. Please call or send an email for more information.
(800) 547-6557 Sales@Netech.org

2. OPERATING INSTRUCTIONS

Menu Descriptions

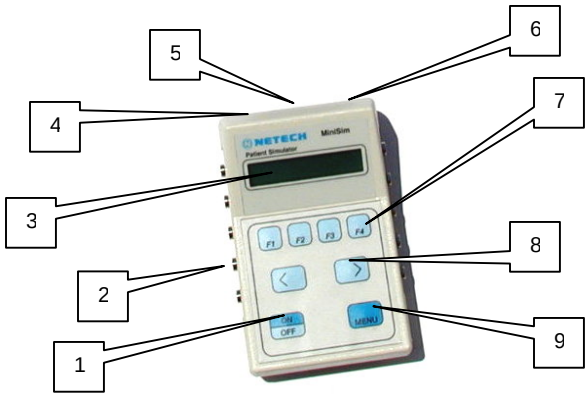
The following are the menu sequence displays, their abbreviations, definitions, and default settings.

SIMULATOR MENU			
Ecg	**Resp**	**Bp**	**Temp**

Ecg: ECG
Default Setting: Normal Sinus Rhythm (NSR) at 80 BPM with Amplitude of 1 mV
Resp: Respiration
Default Setting: 30 BPM, Impedance 500 Ohms, Delta R 1.0 Ohm, and Apnea Off
Bp: Blood Pressure
Default Setting: 120/80 Dynamic Setting
0 Static Setting
Temp: Temperature
Default Setting: YSI 700 series set to 25°C
YSI 400 series set to 25°C

CONTROLS AND INDICATORS

1. **On-Off Key**
2. **ECG Lead Snaps**
3. **LCD Display**
4. **Temperature Connector**
5. **Blood Pressure Connector**
6. **Hi-Level ECG Output**
7. **Function Keys:** ‘F1’, ‘F2’, ‘F3’, ‘F4’.
8. **Arrow Keys:** ‘<’ and ‘>’.
9. **Menu Key**



The operating menu of the MiniSim 1000 is arranged in a tree structure. When turned on, the microcontroller initializes a test routine and displays the model and software version numbers and then switches to the Main Menu.

During operation, the ‘MENU’ key returns the currently displayed menu to the previous menu.

The ‘F1’, ‘F2’, ‘F3’, and ‘F4’ keys select the parameter for simulation, the specific type of parameter, and the functional characteristics of the parameter.

The ‘<’ and ‘>’ arrow keys move through the available choices under the selected parameter.

Basic Operating Instructions:

1. Connect the MiniSim 1000 to a patient monitor using the ECG lead snaps, correct blood pressure interface cable, and correct temperature interface cable.
2. Turn the Minisim 1000 On.
3. Select the parameter for simulation,
‘ECG’, ’ Resp’, ‘ BP’, or ‘Temp’.
4. Continue to select choices under the
parameter to be simulated until the functional characteristics have been chosen.
5. Each Parameter has default settings.

ECG Menu			
Base	**Perf**	**Arth**	**Aut**

Base: **Baseline ECG**
Perf: **Performance Waveforms**
Arth: **Arrhythmia Waveforms**
Aut: **Automatic Test Sequences**

Baseline ECG			
NSR	**PCR**	**ST**	**RWD**

NSR: **Normal Sinus Rhythm**
PCR: **Pacer Waveforms**
ST: ST Segment Analysis Waveforms
RWD: **R Wave Detection**

NSR/	
Rate	**Ampl**

Rate and Amplitude selections under NSR are:

Rate: 30 60 70 80 90 100 120 150 180 210 240 270 300 350
Ampl:.15 0.3 0.5 1.0 2.0 3.0 4.0 5.0

Pacer Waves	
Atr	**Vent**

Selecting **Atr** branches to:

Atr_Pcr Waves			
+ve	**AP**	**PCR**	**ASP**

+ve: Changes pacer pulse from positive (+ve) to negative (– ve).

AP: Atrial Pacer – Normal Paced Rhythm
QRS with rate of 60 BPM and Pacemaker pulses with amplitudes of + 2 mV and –2 mV with duration of 0.1 ms or 2 ms with a normally paced QRS T (QRS amplitude of 1 mV, duration of 100 ms, T wave amplitude of 0.2 mV, duration of 180 ms, and Q-T interval of 350ms)

PCR: Pacer Pulses Alone. Amplitude default setting of 1.0 mV and width of 1.0 ms.

Widt: width selections
0.1 0.2 0.5 1.0 1.5 2.0

Ampl: amplitude selections
.15 0.3 0.5 1.0 2.0 3.0 4.0 5.0

ASP: Asynchronous Pacer – Ineffective pacing.
A non-synchronized waveform that combines QRS waves at 30 BPM and other specifications as in AP above with pacer waves with a 0.1 ms or 2 ms width and amplitude of ± 2 mV at 80 BPM.

Note: 0.1 ms pacer width for AP and ASP can only be selected by going to 'PCR'. A selection other than 0.1 ms produces 2 ms wide pulses.

Selecting **Vent** branches to:

Vtr_Pcr Waves	
VP	**AVP**

VP: Ventricular Pacer at 70 BPM
AVP: Atrial Ventricular Pacer at 70 BPM

Selecting **ST** branches to:

ST-SEGMENT			
ele	**dep**	**MI**	**TalT**

ST segment analysis waveforms are divided into four classes:
ele: **ST Elevation**
dep: **ST Depression**
MI: **Myocardial Infarction**
TalT: **Tall T Wave Rejection**

ST _ELVATION			
7%	**13%**	**20%**	**Flat**

ST Elevation: 7, 13, and 20% DC levels of ST Elevation may be selected. Example: at a QRS amplitude of 1 mV, ST segments are produced at positive DC levels of 70, 130, and 200 micro volts.

Waveforms may be selected with a '**Flat**', a positive '**+sl**', or a negative '**-sl**' slope. The ST segment is proportional to the ECG amplitude setting.

ST _DPRESION			
7%	**13%**	**20%**	**Flat**

ST Depression: Identical to ST Elevation except the ST segments are now depressed.

Selecting **MI** Myocardial Infarction branches to:

Myocard_Inf			
Isc	**Inj**	**Inf**	**Iinf**

Isc: Ischemia
Inj: Injury
Inf: Infarction
Iinf: Inferior Infarction

Isc: Ischemia : Normal Sinus Rhythm (NSR) with fully inverted T waves. This is a condition of reduced blood supply to the heart in a normal patient.
INJ: Injury. A waveform with ST elevation of 20% with a negative slope and inverted T wave.

Inf: Infarction. Normal Sinus Rhythm (NSR) with a large Q wave with the amplitude increased six times and the width increased three times compared to normal.

Iinf: Inferior Infarction. A waveform with the Q wave modified as in Infarction and the ST segment elevated 7% as in ST Elevation.

Selecting **TalT** branches to:

TalT/Rate = 80	
Rate	**Ampl**

An 80 BPM QRS test signal of 1 mV amplitude and 100 ms duration is generated with a T wave duration of 180 ms and Q-T interval of 350 ms.

The T wave amplitude may be varied from 0 to 1.2 mV in steps of 0.1 mV .

Rate: 80 BPM
Amplitude: 0.0 0.1 0.2 0.3 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2

Selecting **RWD** branches to:

RWD/	
Widt	**Ampl**

RWD: R Wave Detection. A QRS waveform is generated at 70 BPM with selectable width and amplitude changes.

Widt: Width default setting 100 msec
10 40 50 60 70 80 90 100 110 120

Ampl: Amplitude default setting 1.0 mV
.15 0.3 0.5 1.0 2.0 3.0 4.0 5.0

Perf. Waves			
SIN	**SQR**	**TRI**	**PLS**

SIN: **Sine Wave**
SQR: **Square Wave**
TRI: **Triangle Wave**
PLS: **Pulse Wave**

SIN/	
Freq	**Ampl**

	SQR/
Freq	**Ampl**
	TRI/
Freq	**Ampl**

The frequency and amplitude default settings and choices are the same for the sine, square and triangle performance waveforms.

Freq: Frequency default setting 1.0 Hz
0.9 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10 20 30 40 50 60 70 80 90 100
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8

Ampl: Amplitude default setting 2.0 mV
2.0 3.0 4.0 5.0 0.2 0.5 1.0

Pulse wave default setting: A pulse wave is generated at 4 second intervals with an amplitude of 1mV and width of 20 ms.

Selecting **Arr** branches to:

	Arrhythmia Menu	
Atr	**AC**	**Vent**

Arrhythmias are divided into Atrial, Atrial Conduction, and Ventricular waveforms. Normal Sinus Rhythm (NSR) at 80 BPM is the default waveform in this menu. Function keys select the desired arrhythmia and the MENU key clears the arrhythmia to NSR.

The following are the arrhythmia definitions:

Atrial: Atrial Arrhythmias

SA: Sinus Arrhythmia: The ECG rate uniformly increases and decreases continuously. The pattern is cyclic with rates changing in the following order: 60, 70, 80, 90, 100, 90, 80, 70, 60 BPM.

M80: Missing Beat: Normal Sinus Rhythm is generated at 80 BPM with every 10th beat missing.

AFLT: Atrial Flutter: Varying ECG rates with 12 cycles at 60 BPM for 12 seconds, 9 cycles at 90 BPM for 6 seconds, 15 cycles at 150 BPM for 6 seconds repeating with large P waves at 300 BPM. This corresponds to ventricular responses of 5:1 for 12 seconds, 3:1 for 6 seconds, and 2:1 for 6 seconds.

AFB: Atrial Fibrillation: Irregular QRS complexes with no P waves and constantly changing R-R intervals are generated. The rate varies in a cyclic fashion at 30, 60, 70, 80 and 30 BPM with low amplitude oscillations on the baseline.

PAT: Paroxysmal Atrial Tachycardia: NSR is generated at 180 BPM with inverted P waves.

NODL: Junctional Premature Contraction: NSR is generated at 80 BPM with a short PR interval. The QRS starts immediately following the P wave.

AC: Atrial Conduction Arrhythmias

AB1: First Degree AV Block: The QRS is generated at 80 BPM, the P wave precedes the QRS by a fixed but prolonged PR interval > 0.2 seconds (PR interval = 0.26 seconds).

MB1: Second Degree AV Block: Mobitz I: Wenckebach: The QRS is generated at 80 BPM. There is a progressive lengthening of the PR interval with intermittent dropped beats. The PR intervals are 170, 230, and 310 ms.

MB2: Second Degree AV Block: Mobitz II: The QRS is generated at 80 BPM with every 4th QRS missing. The PR interval is constant at 170 ms.

AB3: Third degree AV Block: The P wave and QRS are independent of each other. The P wave is generated at 80 BPM and the QRS is generated at 50 BPM.

RBB: Right Bundle Branch Block: A prolonged QRS (>0.12 sec) is generated at 80 BPM. The resulting QRS looks like the letter "M".

LBB: Left Bundle Branch Block: A widened QRS is generated at 80 BPM with a large wide S wave.

LAH: Left Anterior Hemiblock: A QRS is generated at 80 BPM with an S wave larger than the R wave.

Ventricular: Ventricular Arrhythmias

PV1: Premature Ventricular Contraction 1: NSR is generated at 80 BPM. Each time the 'F1' function key is pressed one PVC is generated.

PV3: Premature Ventricular Contraction 3: NSR is generated at 80 BPM. Each time the 'F2' function key is pressed 3 PVCs are generated.

PV6: Premature Ventricular Contraction 6: NSR is generated at 80 BPM. Each time the 'F3' function key is pressed 6 PVCs are generated.

PV12: Premature Ventricular Contraction 12: NSR is generated at 80 BPM. Each time the 'F4' function key is pressed 12 PVCs are generated at different intervals.

PV24: Premature Ventricular Contraction 24: NSR is generated at 80 BPM. Each time the 'F1' function key is pressed 24 PVCs are generated at different intervals.

BGY: Bigeminy: NSR is generated at 80 BPM with every other beat as a PVC.

TGY: Trigeminy: NSR is generated at 80 BPM with every third beat as a PVC.

PVC: Premature Ventricular Contraction: Continuous PVCs are generated at 80 BPM.

VFLT: Ventricular Flutter: Sine waves at 240 BPM are generated with irregular amplitudes.

VFB: Ventricular Fibrillation: A totally irregular waveform is generated with chaotic undulations of the baseline.

VTC: Ventricular Tachycardia: A fast moving series of PVCs is generated at 210 BPM.

PVR: Right Focal PVC: NSR is generated at 80 BPM with every 10th beat a right focal PVC.

Selecting **Aut** branches to:

<Auto Sequence>
RWD TalT PPR TAC

The Automatic Test Sequence generates test waveforms in sequences according to AAMI requirements eliminating the need for the user to make numerous manual selections.

The automatic test sequences are:

RWD: R Wave Detection
TalT: Tall T Wave Rejection
PPR: Pacemaker Pulse Rejection
TAC: Time for Alarm for Tachycardia

The automatic sequence is initiated when the test is selected and continues until all of the test patterns have been generated. During the test sequence the values generated are displayed on the LCD. At the completion of the automatic test, the display will return to its steady mode.

RWD: R Wave Detection. R waves are generated with three varying parameters of amplitude, width, and rate. The three parameter values are displayed on the LCD while generated. Each test waveform is displayed for 20 seconds.

The complete waveform test sequence is performed in three separate sets.

Set 1: Variable Parameters
Amplitude: 0.5, 2, 5 mV
Width: 100, 70, 120 ms
Rate: 80, 30, 210 BPM

Set 1 Complete Test Sequence

Amplitude (mV)	Width (ms)	Rate (BPM)	Time (sec)
0.5	100	80, 30, 210	20
	70	80, 30, 210	20
	120	80, 30, 210	20
2.0	100	80, 30, 210	20
	70	80, 30, 210	20
	120	80, 30, 210	20
5.0	100	80, 30, 210	20
	70	80, 30, 210	20
	120	80, 30, 210	20

As the test progresses, the indicated heart rate displayed on the patient monitor should be within ± 10% or ± 5 BPM whichever is greater of the applied rate.

Set 2: Variable Parameters
Amplitude: 0.15 mV
Width: 70, 120 ms
Rate: 30, 210 BPM

Set 2 Complete Test Sequence

Amplitude (mV)	Width (ms)	Rate (BPM)	Time (sec)
0.15	70	30, 210	20
0.15	120	30, 210	20

The monitor will not respond to the waveforms in this sequence Set.

Set 3: Variable Parameters
Amplitude: 1.0 mV
Width: 10 ms
Rate: 30, 210 BPM

Set 3 Complete Test Sequence

Amplitude (mV)	Width (ms)	Rate (BPM)	Time (sec)
1.0	10	30, 210	20

The patient monitor will not respond to the waveforms in the Set 3 test sequence.

TalT: Tall T Wave Rejection. QRS and T waves are generated with the following values:

QRS: Rate 80 BPM
Amplitude 1 mV
Width 100 ms
T Wave Duration 180 ms
QT Interval 350 ms
T Wave Amplitude 0.0, 0.2, 0.4, 0.6, 0.8, 1.0, and 1.2 mV .

In the automatic test sequence the T Wave Amplitude steps through the changes at one minute intervals. The display indicates the T Wave Amplitude and the QRS Rate.

As the T wave amplitude increases, the first value at which the patient monitor counts the T wave at 80 ± 8 BPM should be noted. This value should match the patient monitor manufacturer's specification.

PPR: Pacemaker Pulse Rejection. The test sequence cycles through normal paced rhythm (AP), ineffective pacing (Asynchronous Pacing ASP), and pacemaker pulses alone (PCR).

For normal pacing (AP),QRS and pacer waves are generated with the following values:

QRS: Amplitude 1 mV
Width 100 ms
T wave: Amplitude 0.2 mV
Duration 180 ms
Q-T Interval 350 ms
R-R Interval 1 Sec
Pacer: Amplitude 2 mV, -2 mV
Width 2 ms, 0.1 ms

For ineffective pacing (ASP), the values of the QRS and pacer waves are the same as normal pacing except for the QRS rate that becomes 30 BPM and the pacer rate that becomes 80 BPM.

During the ASP and AP test sequences the display will show the pacer amplitude, the pacer width, and the QRS rate.

For pacemaker pulses alone (PCR) the values generated are:
Pacer: Rate 60 BPM
Width 2.0 ms, 0.1 ms
Amplitude 2 mV, -2 mV

During the PCR test sequence the display will show the pacer amplitude, the pacer width, and the QRS rate.
Each set of values in the test sequence is generated and displayed for 20 seconds.

TAC: Time to Alarm for Tachycardia. The TAC test is designed to measure the time it takes for the patient monitor to alarm after the onset of ventricular tachycardia. The low and high alarms on the patient monitor should be set at 60 BPM 100 BPM before starting the test.

This auto test sequence generates a QRS wave form at the rate of 80 BPM alternating with a ventricular tachycardia waveform with rates of 206 and 195 BPM and amplitudes of 1.0, 0.5, 2.0, and 4.0 mV.

Each waveform is generated for 20 seconds and the display will show the amplitude and the rate of the waveform being generated.

The following is the sequence of waveforms:

QRS			Ventricular Tachycardia	
Rate (BPM)	Amp (mV)	Width (ms)	Rate (BPM)	Amp (mV)
80	1	100	206	1.0
80	1	100	206	0.5
80	1	100	206	2.0

QRS		Ventricular Tachycardia		
Rate (BPM)	Amp (mV)	Width (ms)	Rate (BPM)	Amp (mV)
80	1	100	195	2.0
80	1	100	195	1.0
80	1	100	195	4.0

RESPIRATION:
Select Resp in the Simulator Menu to access the Respiration selections.

Resp Menu			
Rate	**Imp**	**dR**	**Apne**

Respiration waveforms are generated with four selectable rates, baseline impedances, and delta impedance variations.

The Respiration default settings are:

Respiration Rate	30 BPM
Impedance	500 Ohms
Delta Impedance	1.0 Ohm
Apnea	Off

The value changes that may be made are:
Rate: 15, 30, 60, 120 BPM.
Impedance: 250, 500, 750, and 1000 Ohms.
Delta Impedance: 0.1, 0.5, 1.0, and 1.5 Ohms.

Apnea:

Resp/Apne=Off			
Off	**Cont**	**12s**	**32s**

Off: Apnea is absent. Normal respiration waveforms are generated.
Cont: Continuous Apnea. No respiration waveforms are generated.
12s: No respiration waveform is generated for 12 seconds.
32s: No respiration waveform is generated for 32 seconds.

BLOOD PRESSURE:
Select Bp in the Simulator Menu to access Blood Pressure selections.

BP1 Menu	
Dyna	**Stat**

Two blood pressure waveforms are generated with selections of 12 static and 6 dynamic values. BP1 values are selected from the listed choices and BP2 values are ½ of those selected for BP1.

The Dynamic pressure waveforms track the Normal Sinus Rhythm rates.

The default settings for pressure values are:

BP1	Dynamic: 120/80	Static:	0
BP2	Dynamic: 60/40	Static:	0

The Dynamic pressure value selections are:

100/60	120/80
50/10	60/20
70/30	80/40

The Static pressure value selections are:

0	5	10	20
25	30	40	50
100	150	200	300

TEMPERATURE:

Select Temp in the Simulator Menu to access Temperature value selections.

	Temp Menu	
YSI400		**YSI700**

Temperature simulation is provided for both YSI 400 and YSI 700 standards. The temperature default setting for both is 25 degrees Centigrade.

The Temperature value selections are:

25 C 37 C for both YSI 400 and YSI 700.

CALIBRATION

The MiniSim 1000 is shipped from the factory fully calibrated with a Certificate of Calibration traceable to the NIST. Annual calibration is recommended. Contact the Customer Service Department for instructions for returning the instrument to Netech for either calibration or repair.

Extended Warranty Option:

If the instrument Is returned to Netech Technical Service for its recommended annual calibration, the standard one year warranty is extended for a second year.

Appendix A

NETECH

ISO 9001 - 2000 Registered
SBA 8 (a) Certified

CATALOG 2007

Biomedical / Industrial

Test & Measuremnt Instrumnets

Products

- Arrhythmia Simulator
- Defibrillator Analyzer
- Pacemaker Analyzer
- Patient Simulator
- Safety Analyzer
- Pressure Meter
- Tachometer
- Flow Meter
- Service Kits
- SPO2 Simulator
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